

II. EXECUTIVE SUMMARY

THE ABSR FACILITY AT THE PANOCHE DRAINAGE DISTRICT

The Algal-Bacterial Selenium Removal (ABSR) Facility has been operating for a year in the Panoche Drainage District (PDD) near Firebaugh, California. There are two identical systems consisting of a series of three ponds designed both to produce selenium- and nitrate-reducing bacteria and to produce and harvest microalgae for bacterial substrate. The Reduction Pond (RP) is fed tile drainage water and organic bacterial substrates. Native bacteria such as *Acinetobacter* and *Pseudomonas* use the substrates as a carbon and energy source and reduce oxygen, then nitrate, and finally selenate. The second pond in the series is a 0.1-acre shallow, paddle wheel-mixed High Rate Pond (HRP) which is designed to maximize the growth of green microalgae. The algae are collected in a 1,400-sq. ft. Algae Settling Pond (ASP) that follows the HRP. These algae are harvested and then added to the RP for use as bacterial substrate.

The ABSR Facility at PDD has recently removed 90% of total soluble selenium from a flow of 3,200 gallons per day of subsurface agriculture drainage water from 396 $\mu\text{g/L}$ to 34 $\mu\text{g/L}$. In past studies total soluble selenium concentrations have reached less than 10 $\mu\text{g/L}$ in the ABSR process (Gerhardt and Oswald, 1990). The estimated cost of drainage water treatment is less than \$100 per acre-ft in systems larger than 10 million gallons per day (SOA, Inc., 1988).

It is proposed to continue the operation and evaluation of the ABSR Facility at PDD for three years. During this period, systematic studies utilizing the two identical systems will be conducted to improve and optimize selenium removal at the lowest possible cost.

With the wide-spread implementation of the ABSR Technology in the western San Joaquin Valley the loading of selenium to the San Joaquin River and the Delta would be substantially reduced lowering the potential for toxic impacts upon wildlife.